



Cami McKinney  
Timp Cave National Monument  
RR3 Box 200  
American Fork, UT 84003  
TEL: (801) 756-5661

RE: AF River WQ

Dear Cami McKinney:

Lab Set ID: 1608206

3440 South 700 West  
Salt Lake City, UT 84119

American West Analytical Laboratories received sample(s) on 8/10/2016 for the analyses presented in the following report.

Phone: (801) 263-8686  
Toll Free: (888) 263-8686  
Fax: (801) 263-8687  
e-mail: [awal@awal-labs.com](mailto:awal@awal-labs.com)  
web: [www.awal-labs.com](http://www.awal-labs.com)

American West Analytical Laboratories (AWAL) is accredited by The National Environmental Laboratory Accreditation Program (NELAP) in Utah and Texas; and is state accredited in Colorado, Idaho, New Mexico, Wyoming, and Missouri.

All analyses were performed in accordance to the NELAP protocols unless noted otherwise. Accreditation scope documents are available upon request. If you have any questions or concerns regarding this report please feel free to call.

Kyle F. Gross  
Laboratory Director

Jose Rocha  
QA Officer

The abbreviation "Surr" found in organic reports indicates a surrogate compound that is intentionally added by the laboratory to determine sample injection, extraction, and/or purging efficiency. The "Reporting Limit" found on the report is equivalent to the practical quantitation limit (PQL). This is the minimum concentration that can be reported by the method referenced and the sample matrix. The reporting limit must not be confused with any regulatory limit. Analytical results are reported to three significant figures for quality control and calculation purposes.

Thank You,

Approved by: \_\_\_\_\_  
Laboratory Director or designee



# INORGANIC ANALYTICAL REPORT

**Client:** Timp Cave National Monument **Contact:** Cami McKinney  
**Project:** AF River WQ  
**Lab Sample ID:** 1608206-001  
**Client Sample ID:** AF River - American Fork River  
**Collection Date:** 8/9/2016 1630h  
**Received Date:** 8/10/2016 952h

## Analytical Results

## TOTAL METALS

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Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Arsenic	mg/L	8/10/2016 1350h	8/11/2016 2107h	E200.8	0.00200	< 0.00200	
Calcium	mg/L	8/10/2016 1350h	8/18/2016 1428h	E200.7	5.00	<b>63.0</b>	
Lead	mg/L	8/10/2016 1350h	8/11/2016 2107h	E200.8	0.00200	< 0.00200	
Magnesium	mg/L	8/10/2016 1350h	8/18/2016 1426h	E200.7	1.00	<b>18.2</b>	
Mercury	mg/L	8/15/2016 1315h	8/16/2016 948h	E245.1	0.000150	< 0.000150	
Potassium	mg/L	8/10/2016 1350h	8/18/2016 1426h	E200.7	1.00	< 1.00	
Sodium	mg/L	8/10/2016 1350h	8/18/2016 1426h	E200.7	1.00	<b>4.77</b>	
Zinc	mg/L	8/10/2016 1350h	8/11/2016 2107h	E200.8	0.00500	< 0.00500	

web: www.awal-labs.com

Kyle F. Gross  
 Laboratory Director

Jose Rocha  
 QA Officer



# INORGANIC ANALYTICAL REPORT

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**Project:** AF River WQ  
**Lab Sample ID:** 1608206-001  
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**Collection Date:** 8/9/2016 1630h  
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## Analytical Results

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Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Acidity (as CaCO <sub>3</sub> )	mg/L		8/11/2016 1000h	SM2310B	15.0	< 15.0	
Bicarbonate (as CaCO <sub>3</sub> )	mg/L		8/11/2016 930h	SM2320B	10.0	<b>149</b>	
Carbonate (as CaCO <sub>3</sub> )	mg/L		8/11/2016 930h	SM2320B	10.0	< 10.0	
Chloride	mg/L		8/18/2016 1429h	E300.0	1.00	<b>6.71</b>	
Nitrate/Nitrite (as N)	mg/L		8/10/2016 1102h	E353.2	0.0100	<b>0.303</b>	
Sulfate	mg/L		8/18/2016 1429h	E300.0	7.50	<b>77.9</b>	
Total Dissolved Solids	mg/L		8/11/2016 1210h	SM2540C	20.0	<b>232</b>	
Total Suspended Solids	mg/L		8/10/2016 1452h	SM2540D	3.00	<b>3.60</b>	

Kyle F. Gross  
 Laboratory Director

Jose Rocha  
 QA Officer

## WORK ORDER Summary

Work Order: **1608206** Page 1 of 1

**Client:** Timp Cave National Monument

Due Date: 8/24/2016

**Client ID:** TIM200

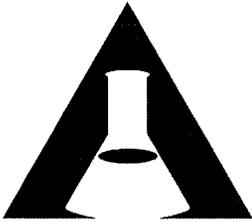
**Contact:** Cami McKinney

**Project:** AF River WQ

**QC Level:** I

WO Type: Standard

Sample ID	Client Sample ID	Collected Date	Received Date	Test Code	Matrix	Sel	Storage	
1608206-001A	AF River - American Fork River	8/9/2016 1630h	8/10/2016 0952h	200.7-W	Aqueous		DF-Metals	4
				<i>4 SEL Analytes: CA MG K NA</i>				
				200.7-W-PR			DF-Metals	
				200.8-W			DF-Metals	
				<i>3 SEL Analytes: AS PB ZN</i>				
				200.8-W-PR			DF-Metals	
				HG-DW-245.1			DF-Metals	
1608206-001B				HG-DW-PR			DF-Metals	
				TDS-W-2540C		DF-tss/tds	1	
1608206-001C				TSS-W-2540D			DF-tss/tds	
				300.0-W		DF-WC		
				<i>2 SEL Analytes: CL SO4</i>				
1608206-001D				ACIDITY-W-2310B			DF-WC	
				ALK-W-2320B		DF-WC		
				<i>2 SEL Analytes: ALKB ALKC</i>				
				NO2/NO3-W-353.2			DF-NO2/NO3	2



**American West Analytical Laboratories**

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**CHAIN OF CUSTODY**

All analysis will be conducted using NELAP accredited methods and all data will be reported using AWAL's standard analyte lists and reporting limits (PQL) unless specifically requested otherwise on this Chain of Custody and/or attached documentation.

1608206

AWAL Lab Sample Set #

Page of

Client: NPS - Timpanogos Cave  
 Address: RR 3 Box 200  
American Fork UT 84003  
 Contact: Camie McKinney  
 Phone #: 801-692-5048 Cell #: \_\_\_\_\_  
 Email: Camie.McKinney@nps.gov  
 Project Name: AF River WQ  
 Project #: \_\_\_\_\_  
 PO #: \_\_\_\_\_  
 Sampler Name: Nathaniel Gilbert

Q Level:		Turn Around Time:					Unless other arrangements have been made, signed reports will be emailed by 5:00 pm on the day they are due.		Due Date:
1	2	3	4	5	Std			8/24	
# of Containers Sample Matrix Lead/Arsenic/Zinc Cadmium - Metals Analysis (4) TDS/TSS Analysis Ammonia - Carbamate, chlorate, sulfate Nitrate								<input type="checkbox"/> Report down to the MDL <input type="checkbox"/> Include EDD: <input type="checkbox"/> Lab Filter for: <input type="checkbox"/> Field Filtered For:  <b>For Compliance With:</b> <input type="checkbox"/> NELAP <input type="checkbox"/> RCRA <input type="checkbox"/> CWA <input type="checkbox"/> SDWA <input type="checkbox"/> ELAP / A2LA <input type="checkbox"/> NLLAP <input type="checkbox"/> Non-Compliance <input type="checkbox"/> Other:	<b>Laboratory Use Only</b> Samples Were: 1 Shipped or hand delivered 2 Ambient or Chilled 3 Temperature <u>5.2</u> °C 4 Received Broken/Leaking (Improperly Sealed) Y N 5 Properly Preserved Y N Checked at bench 6 Received Within Holding Times Y N
	Sample ID:	Date Sampled	Time Sampled	Known Hazards & Sample Comments					COC Tape Was: 1 Present on Outer Package Y N (NA) 2 Unbroken on Outer Package Y N (NA) 3 Present on Sample Y N (NA) 4 Unbroken on Sample Y N (NA)
	1 AF River - American Fork River	8-9-16	16:30	8	W	/	/	/	Discrepancies Between Sample Labels and COC Record? Y N
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
11									
12									

Relinquished by: <u>Nathaniel Gilbert</u> Signature	Date: <u>8/10/16</u>	Received by: <u>Elaine Dyer</u> Signature	Date: <u>8/15/16</u>
Print Name: <u>Nathaniel Gilbert</u>	Time: <u>9:52</u>	Print Name: <u>Elaine Dyer</u>	Time: <u>9:52</u>
Relinquished by: _____ Signature	Date: _____	Received by: _____ Signature	Date: _____
Print Name: _____	Time: _____	Print Name: _____	Time: _____
Relinquished by: _____ Signature	Date: _____	Received by: _____ Signature	Date: _____
Print Name: _____	Time: _____	Print Name: _____	Time: _____
Relinquished by: _____ Signature	Date: _____	Received by: _____ Signature	Date: _____
Print Name: _____	Time: _____	Print Name: _____	Time: _____

Special Instructions:

Lab Set ID: 1608206 / pH Lot 5003

<b>Samples Were:</b>	<b>COC Tape Was:</b>	<b>Container Type:</b>	<b>No. Rec.</b>
<input type="checkbox"/> Shipped By:	<b>Present on Outer Package</b>	<input type="checkbox"/> AWAL Supplied Plastic	
<input checked="" type="checkbox"/> Hand Delivered	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> AWAL Supplied Clear Glass	
<input type="checkbox"/> Ambient	<b>Unbroken on Outer package</b>	<input type="checkbox"/> AWAL Supplied Amber Glass	
<input checked="" type="checkbox"/> Chilled	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> AWAL Supplied VOA/TOC/TOX Vials	
Temperature <u>5.2 °C</u>	<b>Present on Sample</b>	<input type="checkbox"/> Amber <input type="checkbox"/> Clear <input type="checkbox"/> Headspace <input type="checkbox"/> No Headspace	
Rec. Broken/Leaking <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Non AWAL Supplied Container	
<b>Notes:</b>	<b>Unbroken on Sample</b>	<b>Notes:</b>	
Properly Preserved <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
<b>Notes:</b>	<b>Notes:</b>		
Rec. Within Hold <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<b>Discrepancies Between Labels and COC</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Notes:</b>		<b>Notes:</b>	

Bottle Type	Preservative	All pHs OK													
Ammonia	pH <2 H <sub>2</sub> SO <sub>4</sub>														
COD	pH <2 H <sub>2</sub> SO <sub>4</sub>														
Cyanide	pH >12 NaOH														
Metals	pH <2 HNO <sub>3</sub>														
NO <sub>2</sub> & NO <sub>3</sub>	pH <2 H <sub>2</sub> SO <sub>4</sub>														
Nutrients	pH <2 H <sub>2</sub> SO <sub>4</sub>														
O & G	pH <2 HCL														
Phenols	pH <2 H <sub>2</sub> SO <sub>4</sub>														
Sulfide	pH > 9NaOH, ZnAC														
TKN	pH <2 H <sub>2</sub> SO <sub>4</sub>														
TOC	pH <2 H <sub>3</sub> PO <sub>4</sub>														
T PO <sub>4</sub>	pH <2 H <sub>2</sub> SO <sub>4</sub>														
TPH	pH <2 HCL														

- Procedure:
- 1) Pour a small amount of sample in the sample lid
  - 2) Pour sample from Lid gently over wide range pH paper
  - 3) Do Not dip the pH paper in the sample bottle or lid
  - 4) If sample is not preserved properly list its extension and receiving pH in the appropriate column above
  - 5) Flag COC and notify client for further instructions
  - 6) Place client conversation on COC
  - 7) Samples may be adjusted at client request